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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



National Aeronautics and Space Administration

Gulliver on Mars
See Page 227

A SCIENCE SERVICE PUBLICATION

One of a series briefly describing GM's research in depth

ELECTROCHEMICAL ADDITION: 1+1=3

Electroplating is a well-known process . . . on the surface, anyway.

But the plating of just one metal on another may involve a dozen or more physical or chemical events. At the GM Research Laboratories, we are examining some of these to better understand particular idiosyncrasies.

Like the action of organic addition agents. For instance, an organic leveling agent in a plating bath causes more metal to be deposited on low places and less on the high spots—giving a smoother, more level surface. Two together do stranger things. How? Radioactive tracers are telling us.

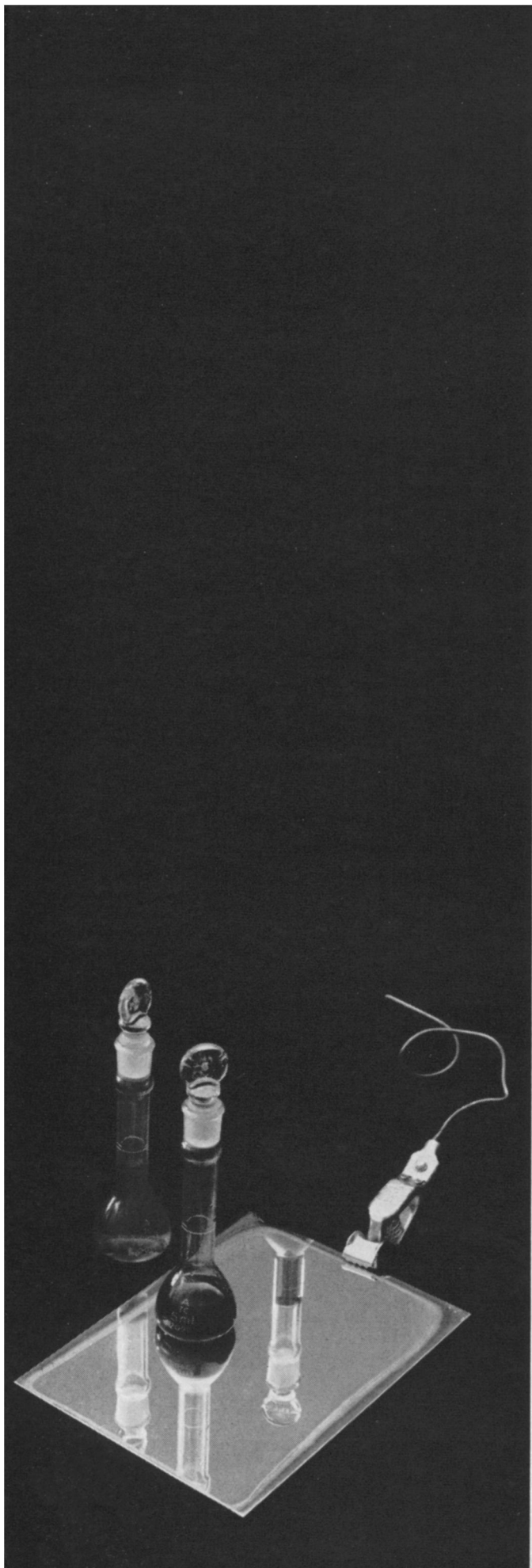
Example: Take a radioactively tagged leveler. More is adsorbed on the peaks of the surface being plated than in the valleys. Its adsorbed ions tend to block current flow, reducing metal deposition most where the ion concentration is greatest. Then add another leveler. It levels, too, but also causes even more adsorption of the *first* one on the high points. More leveling yet.

This one-plus-one-equals-three synergistic effect has been widely used in decorative plating. Now, supported by unique autoradiographic evidence, we have postulated a theoretical explanation. Details are available on request. Briefly, it involves ion interactions and adsorptions and gets deeper into matters of ion and atom bonding and bond breaking—subjects typical of persistent basic research in General Motors.

General Motors Research Laboratories Warren, Michigan

	Before plating	With A alone	With B alone	With A & B
Amount of A adsorbed	0	113	0	189
Amount of B adsorbed	0	0	3	49
Surface roughness	304	279	254	140

Relative adsorptions and roughnesses. Plating with two organic levelers, A and B, added to solution singly and together.



FABULOUS MEXICO—WHERE EVERYTHING COSTS LESS

∴ The land of retirement and vacation bargains

Where you can build a modern home for \$4500 and an American retirement income looks like a fortune. It's the land where your vacation money can buy double or more what it might back home—provided you know where to go for Mexico's best values.

Norman Ford's big book **MEXICO—WHERE EVERYTHING COSTS LESS** tells you exactly where to get all of this country's best vacation and retirement values, where you can live like a prince on what you might just get along on in the U.S.A.

Norman Ford knows Mexico from north to south, from east to west, and he takes you to vacation and retirement areas that look more like the South Seas than Tahiti itself; to whole sections of just perfect weather where it's like June all year round; plus resort after resort, towns, cities, spas and what not else where you'll have a vacation to remember at a cost so low it could seem unbelievable.

If you want a delightful retirement area with plenty of Americans around to talk to, he leads you to all the principal retirement towns, as well as dozens of little known, perhaps even more delightful areas, where costs are way far down, there's plenty to do and meeting people is easy. Always, he shows you modern, flower-bedecked hotels and inns that charge hardly half of what you might expect to spend in even such a land of vacation and retirement bargains as Mexico.

There's a great deal more besides: everything from exploring ancient pyramids as old as Egypt's to finding fabulous hunting and fishing. If you might want to share in the high interest rates Mexican banks pay or to buy equally high-earning real estate or start a business of your own, this detailed guide to a fabulous land tells you what you must do to start your money earning so much more than in the U.S.

MEXICO—WHERE EVERYTHING COSTS LESS opens up Mexico to you. It's a big book, yet it costs only \$1.50. So send for yours today.

WHERE TO RETIRE OR VACATION at what look like prewar prices

OFF-THE-BEATEN PATH

— The guide to America's own Bargain Paradises

In *Off-the-Beaten Path*, the big book by Norman Ford, you can read of island paradises aplenty in the United States and Canada, of art colonies (artists search for picturesque locations where costs are low!), of areas with almost a perfect climate or with flowers on every side.

Here are the real U.S.A.-brand Shangri-Las made for the man or woman who's had enough of crowds. Here, too, are unspoiled seashore villages, tropics like islands, and dozens of other spots just about perfect for your retirement or vacation at some of the lowest prices you've heard of since the gone-forever prewar days. And for good measure you also read about the low-cost paradises in Hawaii, the Virgin Islands, and Puerto Rico.

You can be sure that *Off-the-Beaten Path* names the low-cost Florida retirement and vacationing towns, the best values in Texas, the Southwest, California, the South and East, Canada—and a dozen other areas which the crowds have not yet discovered:

- That undiscovered region where winters are as warm as Miami Beach's yet costs can be two-thirds less.
- That island that looks like Hawaii yet is 2000 miles nearer (no expensive sea or air trip to get there).
- France's only remaining outpost in this part of the world—completely surrounded by Canadian territory . . . or a village more Scottish than Scotland or age-old Spanish hamlets right in our own U. S. where no one ever heard of nervous tension or the worries of modern day life.
- That remarkable town where a fee of 3¢ a day gives you an almost endless round of barbecues, musicals, concerts, picnics, pot luck suppers, smorgasbord dinners, and a fine arts program.

Off-the-Beaten Path is a big book filled with facts that open the way to a different kind of retirement or vacation made all the more attractive by the rock-bottom prices. About 100,000 words and plenty of pictures. Yet it costs only \$2.

TO FIND UTOPIA—FIND AN ISLAND

∴ and here is the book that shows you where and how to find your own island paradise

Name what you want in your Utopia—a hideaway, a magical isle for a short vacation, a gem for retirement on a moderate income, or a place to take time out from the problems of the world while your money goes twice as far. In the pages of **UTOPIA IS AN ISLAND** you'll find it.

In some of these island paradises you can live on a dollar a day, even in this age of inflation and high prices. In others, \$50 a week lets two live like a king and queen. Every one of these Utopias is favored by nature—beautiful, and a sheer joy for a vacation or a longer stay.

Some of these island paradises are close enough to drive to. **UTOPIA IS AN ISLAND** points to many a transplanted Tahiti, to coral islands in Florida, and about 50 other easy-to-drive-to gems scattered from Canada to Mexico. If your eyes were upon Hawaii, Puerto Rico, or the Virgin Islands, but you feared they would be too expensive, wait until you see the corners which Norman Ford has discovered.

You'll also find many another island to which you'll want to set off: lush island paradises off Mexico or in the sparkling Bahamas and West Indies, not far from Florida. Perhaps the Utopias which have fascinated mankind for 3000 years might be the ones you'll want—Majorca, Ibiza, Crete and others. Or you might choose the fabulous Canaries, where one dollar actually does the work of three back home.

Most of these island paradises are so inexpensive you can live here for weeks on what you'd spend back home in just a few days. If you have only a small retirement income, you often find it worth twice as much, or more, in these island Utopias of the world.

Over 100,000 words long, almost 200 pages, **UTOPIA IS AN ISLAND** is your key to an entirely new and different kind of travel, vacationing, or retirement. So why not get this book? It costs only \$2.

2 Guides That Tell You the Whole Story of How to Travel by FREIGHTER

1. The Complete Guide to the World's Passenger-Carrying Freighters Passenger-Carrying FREIGHTERS Are the Secret of Low Cost Travel

Yes, for no more than you'd spend at a resort you can take a never-to-be-forgotten cruise to Rio and Buenos Aires. Or through the West Indies or along the St. Lawrence River to French Canada. In fact, trips to almost everywhere are within your means.

And what accommodations you get: large rooms with beds (not bunks), probably a private bath, lots of good food and plenty of relaxation as you speed from port to port.

Depending upon how fast you want to go, a round-the-world cruise can be yours for as little as \$250-\$300 a month. And there are shorter trips. Fast, uncrewed voyages to England, France, the Mediterranean; two- or three-week vacations up and down the Pacific Coast or elsewhere. Name the port and the chances are you can find it listed in **Travel Routes Around the World**.

This is the book that names the lines, tells where they go, how much they charge, briefly describes accommodations. Hundreds of thousands of travelers all over the world swear by it. Travel editors and travel writers say: "To learn how to travel for as little as you'd spend at a resort, get **Travel Routes Around the World**."

It's yours for just \$1, and the big 1964 edition includes practically every passenger carrying service starting from or going to New York, Canada, New Orleans, the Pacific Coast, Mexico, South America, England, France, the Mediterranean, Africa, the Indies, Australia, the South Seas, Japan, Hawaii, etc. There's a whole section called "How to See the World at Low Cost," plus pages and pages of maps.

A big \$1 worth, especially as it can open the way to more travel than you ever thought possible. For your copy, simply fill out coupon.

2. Norman Ford's Selection of the World's Outstanding Freighters AROUND THE WORLD FOR \$1000

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Ask any one who's gone by freighter, and he'll tell you there simply is nothing else to compare with this informal, lower cost way of seeing the world.

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Remember, freighter travel is a real discovery, and it can save you real money. Wherever the world might be calling you—Europe, the Mediterranean, South America, the Orient, or elsewhere—get the real help of *Today's Best Buys in Freighter Travel*. Send for your copy now—yours for only \$2, a very small sum for the whole new world this book will open for you.

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- Today's Best Buys in Freighter Travel** (Norman Ford's selection of the world's outstanding freighters). \$2.

SPECIAL OFFER: Both books above for \$2.50

Fabulous Mexico—Where Everything Costs Less. \$1.50.

Off-the-Beaten Path (where to retire or vacation at what look like prewar prices). \$2.

Utopia Is an Island. \$2.

SPECIAL OFFER: All 5 books above for only \$6.

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